Title: A tile sponge washing and conditioning apparatus.

Field of the invention.

Background of the invention.

The present invention relates to a tile sponge washing and conditioning apparatus. More specifically, the present invention relates to a tile sponge washing and conditioning apparatus for washing in water a sponge used during a ceramic tile laying operation.

Background information.

A tile laying operation includes laying the tiles onto a layer of adhesive. When the adhesive has set, a grouting compound is applied to the tiles for filling the spaces between adjacent tiles. Excess grout must be removed from the tiles before the grout hardens. In order to remove such excess grout, a dampened sponge is applied to the surface of the tile and wiped across the upper surface of the tile for removing the excess grout from the tiles. The initial process of removing excess grout entails the removal of a considerable amount of grout. Therefore, it is essential that the sponge be frequently immersed into clean water to wash away such excess grout from the sponge. Typically, the sponge is submerged in a bowl of water and is hand squeezed in order to release the grout on the sponge into the bowl of water.

The aforementioned process is time consuming because it is essential that the sponge be

frequently cleaned in order to progressively remove the excess grout from the tiles. Also, because the grout ha s a damaging effect on the skin, the tiler should wear protective gloves when washing and conditioning the sponge in the bowl of water.

The apparatus according to the present invention overcomes the aforementioned problems by the provision of an apparatus which is at least partially immersed in a container of water. In operation of the apparatus, a sponge to be cleaned and conditioned is inserted between counter rotating rollers which feed the sponge through the water in the container and progressively squeeze and release the sponge so that the excess grout is removed from the sponge into the water as the sponge progresses through the apparatus. When the sponge emerges from the apparatus, the sponge has been thoroughly washed and conditioned and is ready for further use on the surface of the tiles for removing further excess grout therefrom. Also, while one sponge is being washed by the apparatus of the present invention, another sponge previously washed and conditioned is used in the removal of excess grout so that no time is wasted waiting for a sponge to be cleaned.

The apparatus according to the present invention cuts down on the time needed to complete a tiling project. Also, the apparatus protects a tiler's hands from the damage caused by immersing the tiler's hands in a bowl of sponge washing water.

Therefore, a primary feature of the present invention is the provision of a tile sponge washing and conditioning apparatus for washing in water a sponge used during a ceramic tile laying operation that overcomes the problems associated with the prior art arrangements.

Another feature of the present invention is the provision of a tile sponge washing and conditioning apparatus that reduces the time required to complete a tiling project.

A further feature of the present invention is the provision of a tile sponge washing and conditioning apparatus that protect the tiler's hands from the damage caused by immersion of a tiler's hands in a bowl of water used to wash grout away from a sponge.

Other features and advantages of the present invention will be readily apparent to those skilled in the art by a consideration of the detailed description of a preferred embodiment of the present invention contained herein.

Summary of the invention.

The present invention relates to a tile sponge washing and conditioning apparatus for washing in water a sponge used during a ceramic tile laying operation. The apparatus includes a frame for disposition thereof within the water. The frame includes a first wall and a second wall which is disposed spaced from the first wall. A first roller has an axis of rotation which extends through the walls and a second roller has a rotational axis which also extends through the walls. The rollers cooperate with each other to define therebetween a pathway for the passage therethrough of the sponge to be washed and conditioned. The arrangement is such that when the rollers are counter rotated relative to each other, the sponge is squeezed and driven through the passageway so that the sponge is washed and conditioned by the water during passage of the sponge through the

passageway.

In a more specific embodiment of the present invention, the frame is fabricated from stainless steel.

Also, the first wall is of planar configuration, the first wall having a first and a second edge, a top and a bottom edge and an inner and an outer surface;

Furthermore, the second wall is also of planar configuration, the second wall having a first and a second side, a top and a bottom end and an inner and an outer face, the second wall being disposed parallel relative to the first wall.

More specifically, the first wall includes a first ear which extends from the first edge. Also, a second ear extends from the second edge.

The second wall includes a first extension which extends from the first side and a second extension which extends from the second side.

Moreover, a container is provided for containing the water. The container defines a rim for supporting the ears and the extensions such that when the ears and extensions are being supported by the rim, the rollers are disposed within the water contained within the container.

Additionally, the frame includes a first reinforcing member which extends between the first ear and the first extension. A second reinforcing member extends between the second ear and the second extension such that the reinforcing members maintain the first and second walls in a spaced parallel disposition relative to each other.

The first roller includes a hub which is disposed coaxially relative to the axis of rotation. The hub extends through the walls such that the walls bearingly support the hub for rotation of the hub relative to the walls. Also, the hub has a first and a second end.

More particularly, a first collar defines a peripheral edge, the first collar being secured to the first end of the hub for rotation with the hub.

Also, a second collar defines a further peripheral edge, the second collar being secured to the second end of the hub for rotation with the hub. Moreover, the collars are disposed between the walls.

A plurality of sponge engaging members extend between the collars. The sponge engaging members are spaced relative to each other along and adjacent to the peripheral edges of the collars. The arrangement is such that when the first roller rotates, the sponge engaging members squeeze and condition the sponge.

Additionally, the second roller includes an axle which is disposed coaxially relative to the

rotational axis. The axle extends through the walls such that the walls bearingly support the axle for rotation of the axle relative to the walls. Also, the axle has a first and a second extremity.

A first flange defines a periphery, the first flange being secured to the first extremity of the axle for rotation with the axle.

Additionally, a second flange defines a further periphery, the second flange being secured to the second extremity of the axle for rotation with the axle. Also, the flanges are disposed between the walls.

Furthermore, a plurality of sponge squeezing members extend between the flanges. The sponge squeezing members are spaced relative to each other along and adjacent to the peripheries of the flanges. The arrangement is structured such that when the second roller rotates, the sponge squeezing members squeeze and condition the sponge.

The sponge engaging members and the sponge squeezing members cooperate together to drive the sponge through the passageway while alternately compressing and releasing the sponge for condition the sponge.

Also, a plurality of pairs of counter rotating rollers are rotatably supported between the walls for further defining the passageway. The pairs of rollers are positioned so that as the sponge progressively is driven from a pair of the rollers to an adjacent pair of rollers, the sponge is

progressively washed and conditioned.

Additionally, a gear wheel is secured to the first roller and a further gear wheel is secured to the second roller.

A drive is connected to the gear wheels for driving the gear wheels in opposite rotational directions relative to each other so that the sponge is driven through the passageway.

Moreover, a geared wheel is secured to each roller respectively of the pairs of rollers so that each of the geared wheels are connected to the drive so that the rollers of each pair are counter rotated relative to each other so that the rollers progressively drive the sponge through the passageway for washing and conditioning the sponge in the water.

More particularly, the drive includes a manual crank for rotating the first and second rollers.

More specifically, the manual crank is provided for rotating the first and second rollers and the pairs of rollers.

In another embodiment of the present invention, the drive includes a motor for rotating the first and second rollers. The drive also includes a motor for rotating the first and second rollers and the pairs of rollers.

Additionally, each of the gear wheels and each of the geared wheels is intermeshed with an adjacent gear or geared wheel.

Furthermore, the passageway has a first and a second end, the sponge being placed adjacent to the first end of the passageway. Also, the cleaned and conditioned sponge exits from the apparatus adjacent the second end of the passageway.

Many modifications and variations of the present invention will be readily apparent to those skilled in the art by a consideration of the detailed description contained hereinafter taken in conjunction with the annexed drawings which show a preferred embodiment of the present invention. However, such modifications and variations fall within the spirit and scope of the present invention as defined by the appended claims.

Brief description of the drawings.

Fig. 1 is a side elevational view of a tile sponge washing and conditioning apparatus according to the present invention for washing in water a sponge used during a ceramic tile laying operation;

Fig. 2 is a view taken on the line 2-2 of Fig. 1;

Fig. 3 is a view taken on the line 3-3 of Fig. 2; and

Fig. 4 is a similar view to that shown in Fig. 3 but shows an alternative embodiment of the present invention.

Similar reference characters refer to similar parts throughout the various views of the drawings.

Detailed description of the drawings.

Fig. 1 is a side elevational view of a tile sponge washing and conditioning apparatus generally designated 10 according to the present invention for washing in water 12 a sponge 14 used during a ceramic tile laying operation. As shown in Fig. 1, the apparatus 10 includes a frame generally designated 16 for disposition thereof within the water 12. The frame 16 includes a first wall 18.

Fig. 2 is a view taken on the line 2-2 of Fig. 1. As shown in Fig. 2, the frame 16 includes a second wall 20 which is disposed spaced from the first wall 18. A first roller generally designated 22 has an axis of rotation 24 which extends through the walls 18 and 20 respectively and a second roller generally designated 26 has a rotational axis 28 which also extends through the walls 18 and 20 respectively. As shown in Fig. 1, the rollers 22 and 26 cooperate with each other to define therebetween a pathway indicated by the arrow P for the passage therethrough of the sponge 14 to be washed and conditioned. The arrangement is such that when the rollers 22 and 26 are counter rotated relative to each other as indicated by the arrows 30 and 32 respectively, the sponge 14 is

squeezed and driven through the passageway P so that the sponge 14 is washed and conditioned by the water 12 during passage of the sponge 14 through the passageway P.

In a more specific embodiment of the present invention, the frame 16 is fabricated from stainless steel.

Also, as shown in Fig. 1, the first wall 18 is of planar configuration, the first wall 18 having a first and a second edge 34 and 36 respectively, a top and a bottom edge 38 and 40 respectively .

As shown in Fig. 2, the wall 18 also has an inner and an outer surface 42 and 44 respectively.

Fig. 3 is a view taken on the line 3-3 of Fig. 2. As shown in Fig. 3, the second wall 20 is of planar configuration, the second wall 20 having a first and a second side 46 and 48 respectively and a top and a bottom end 50 and 52 respectively.

As shown in Fig. 2, the second wall 20 has an inner and an outer face 54 and 56 respectively, the second wall 20 being disposed parallel relative to the first wall 18.

More specifically, as shown in Fig. 1, the first wall 18 includes a first ear 58 which extends from the first edge 34. Also, a second ear 60 extends from the second edge 36.

As shown in Fig. 3, the second wall 20 includes a first extension 62 which extends from the

first side 46 and a second extension 64 which extends from the second side 48.

As shown in Fig. 1, a container 66 is provided for containing the water 12. The container 66 defines a rim 68 for supporting the ears 58 and 60 respectively and the extensions 62 and 64 respectively such that when the ears 58 and 60 and extensions 62 and 64 are being supported by the rim 68, the rollers 22 and 26 respectively are disposed within the water 12 contained within the container 66.

Additionally, as shown in Fig. 2, the frame 16 includes a first reinforcing member 70 which extends between the first ear 58 and the first extension 62. As shown in Fig. 1, a second reinforcing member 72 extends between the second ear 60 and the second extension 64 such that the reinforcing members 70 and 72 respectively maintain the first and second walls 18 and 20 in a spaced parallel disposition relative to each other.

As shown in Fig. 2, the first roller 22 includes a hub 74 which is disposed coaxially relative to the axis of rotation 24. The hub 74 extends through the walls 18 and 20 respectively such that the walls 18 and 20 respectively bearingly support the hub 74 for rotation of the hub 74 relative to the walls 18 and 20. Also, the hub 74 has a first and a second end 76 and 78 respectively.

More particularly, a first collar 80 defines a peripheral edge 82 , the first collar 80 being secured to the first end 76 of the hub 74 for rotation with the hub 74.

Also, a second collar 84 defines a further peripheral edge 86 , the second collar 84 being secured to the second end 78 of the hub 74 for rotation with the hub 74. Moreover, the collars 80 and 84 respectively are disposed between the walls 18 and 20 respectively.

A plurality of sponge engaging members 88, 89 and 90 extend between the collars 80 and 84 respectively. The sponge engaging members 88-90 are spaced relative to each other around and adjacent to the peripheral edges 82 and 86 respectively of the collars 80 and 84 respectively. The arrangement is such that when the first roller 22 rotates, the sponge engaging members 88-90 squeeze and condition the sponge 14.

Additionally, the second roller 26 includes an axle 92 which is disposed coaxially relative to the rotational axis 28. The axle 92 extends through the walls 18 and 20 respectively such that the walls 18 and 20 respectively bearingly support the axle 92 for rotation of the axle 92 relative to the walls 18 and 20. Also, the axle 92 has a first and a second extremity 94 and 96 respectively.

A first flange 98 of the axle 92 defines a periphery 100, the first flange 98 being secured to the first extremity 94 of the axle 92 for rotation with the axle 92.

Additionally, a second flange 102 defines a further periphery 104, the second flange 102 being secured to the second extremity 96 of the axle 92 for rotation with the axle 92. Also, the flanges 98 and 102 respectively are disposed between the walls 18 and 20.

Furthermore, a plurality of sponge squeezing members 106, 107 and 108 extend between the flanges 98 and 102 respectively. The sponge squeezing members 106-108 are spaced relative to each other around and adjacent to the peripheries 100 and 104 respectively of the flanges 98 and 102 respectively. The arrangement is structured such that when the second roller 26 rotates as indicated by the arrow 32 as shown in Fig. 1, the sponge squeezing members 106-108 squeeze and condition the sponge 14.

The sponge engaging members 88-90 and the sponge squeezing members 106-108 cooperate together to drive the sponge 14 through the passageway P while alternately compressing and releasing the sponge 14 for condition the sponge 14.

Also, as shown in Fig. 1, a plurality of pairs of counter rotating rollers 110 and 111, 112 and 113, 114 and 113, 115 and 113, 116 and 113, 116 and 111, 117 and 26, 118 and 119 are rotatably supported between the walls 18 and 20 for further defining the passageway P. The pairs of rollers 110 and 111, 112 and 113, 114 and 113, 115 and 113, 116 and 113, 116 and 111, 117 and 26, 118 and 119 are positioned so that as the sponge 14 progressively is driven from a pair of the rollers such as 110 and 111 to an adjacent pair of rollers 112 and 113, the sponge 14 is progressively washed and conditioned.

Additionally, a gear wheel 120 is secured to the first roller 22 and a further gear wheel 122 is secured to the second roller 26.

As shown in Fig. 2, a drive generally designated 124 is connected to the gear wheels 120 and 122 for driving the gear wheels 120 and 122 in opposite rotational directions relative to each other as indicated in Fig. 1 by the arrows 30 and 32 respectively so that the sponge 14 is driven through the passageway P in the direction as indicated by the arrow 130.

Moreover, a geared wheel 131, 132, 133, 134, 135, 136, 137 138 139 and 140 is secured to each roller of the pairs of rollers 110 and 111, 112 and 113, 114 and 113, 115 and 113, 116 and 113, 116 and 111, 117 and 26, 118 and 119 so that each of the geared wheels 131-140 are connected to the drive 124 so that the rollers of each pair 110 and 111, 112 and 113, 114 and 113, 115 and 113, 116 and 113, 116 and 111, 117 and 26, 118 and 119 are counter rotated relative to each other so that the rollers 110 and 111, 112 and 113, 114 and 113, 115 and 113, 116 and 113, 116 and 111, 117 and 26, 118 and 119 progressively drive the sponge 14 through the passageway P for washing and conditioning the sponge 14 in the water. 12.

As shown in Fig. 1, reversing gears intermesh with the geared wheels 131-140 of the respective pairs of rollers 110 and 111, 112 and 113, 114 and 113, 115 and 113, 116 and 113, 116 and 111, 117 and 26, 118 and 119 so that all of the pairs of rollers 110 and 111, 112 and 113, 114 and 113, 115 and 113, 116 and 113, 116 and 111, 117 and 26, 118 and 119 and the first and second rollers 22 and 26 are driven in the directions indicated by the arrows by the drive 124.

More particularly, as shown in Fig. 3, the drive 124 includes a manual crank 154 for rotating the first and second rollers 22 and 26.

More specifically, the manual crank 154 is provided for rotating the first and second rollers 22 and 26 and the pairs of rollers 110 and 111, 112 and 113, 114 and 113, 115 and 113, 116 and 113, 116 and 111, 117 and 26, 118 and 119.

Fig. 4 is a similar view to that shown in Fig. 3 but shows an alternative embodiment of the present invention. As shown in Fig. 4, the drive 124 includes a motor 156 for rotating the first and second rollers 22 and 26 respectively. The motor 156 which may be an electric motor which has a transformer for connection to a mains supply. The motor 156 is provided for rotating the first and second rollers 22 and 26 and the pairs of rollers 110 and 111, 112 and 113, 114 and 113, 115 and 113, 116 and 113, 116 and 111, 117 and 26, 118 and 119.

Additionally, each of the gear wheels 120 and 122 and each of the geared wheels 131-140 is intermeshed with an adjacent wheel.

Furthermore, as shown in Fig. 1, the passageway P has a first and a second end 158 and 160 respectively, the sponge 14 being placed adjacent to the first end 158 of the passageway P. Also, the cleaned and conditioned sponge 14 exits from the apparatus 10 adjacent the second end 160 of the passageway P.

In operation of the apparatus according to the present invention, a sponge 14 that has been used for removing excess grout from freshly laid tiles is placed between the rollers at the first end 158 of the passageway P so that as the pairs of cooperating rollers rotate, the sponge 14 is

progressively squeezed and released in the water within the container so that when the sponge emerges from the pathway P, the sponge is clean and reconditioned and ready for use in the removal of further excess grout from the tiles.

The present invention provides a unique apparatus for washing and conditioning a grouting sponge which greatly reduces the time taken to complete a grouting project and which also protects the tiler's hands from excessive contact with the grout.